

# ST. BARTHOLOMEW'S HOSPITAL JOURNAL



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# ST. BARTHOLOMEW'S HOSPITAL JOURNAL

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July, 1953

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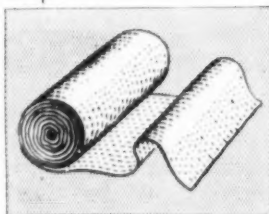
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# ST. BARTHOLOMEW'S HOSPITAL JOURNAL

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## CUISINE

*"When this information is not afforded and nature herself will yield nothing of her own accord, medicine has found means of compulsion whereby nature is constrained, without being harmed, to give up her secrets."*—ON ANCIENT MEDICINE, Hippocratic School.

The profession of medicine evolved from the art of cookery—the oldest and humblest and most empirical of sciences. This was the Hippocratic view of its own origin, an origin of which that school of physicians was unexpectedly proud. Theirs was a practical discipline; it stood or fell, like cookery, by its results.

Without such particularity about our origins we model ourselves on those ancient Greeks. We like their pride in their profession as a craft, their concern for their patients before their science, their insistence that diagnosis cannot be reached until every method of observation has been exhausted.

And yet Francis Bacon's criticism of medicine before Harvey—"a science which has been more professed than laboured and yet more laboured than advanced"—is true of medicine today, most particularly true of General Practice, and his diagnosis still stands—this is due "to the discontinuance of the ancient and serious discipline of Hippocrates."

Supposing that Hippocrates was an individual and not a school or a point of view, as with Homer and Isaiah he is alleged to have been, and imagining that he wakes like Rip van Winkle in 1953, we can ask what his views on modern medicine would be. In view of the discovery of anaesthesia he would hasten to amend his oath. He might, or might not, be impressed with our professional standards. He would be amazed that by the chance of history his name had come to represent all that was best in his school and,

being an educated Greek, he would find the National Health Service very hard to understand. Accepting the view that it is impossible to apply all our bewildering diagnostic methods to every patient, he would still be puzzled at the disorganisation whereby so many doctors are prevented from using even the simplest of these "means of compulsion" by their conditions of work. He would marvel that some even affect to despise laboratory methods relying on some nebulous "clinical sense"—a diagnostic instrument which would not appeal to him.

A memorable lecture was given lately to the Abernethian Society; unusually enough by a G.P. It dealt of mundane things, of the contents of a doctor's bag, of consulting-room couches, of a private laboratory fitted out in an old kitchen (surely in the best Hippocratic tradition) and of a branch of the Portable X-ray Company set up in a mews cottage. It was delivered in a style that suggested the administrator or the don, yet it was received with excitement and even punctuated with applause.

Two things are certain. Many students in their final years still wish to enter General Practice, "proud to make it a life's work and respecting it as a difficult and special subject."

Secondly, such a student is ill at ease because he is trained to a type of medicine for which General Practice, for reasons not particularly related to the Health Service, gives little scope at present. He has spent a large part of his training in the Path. Lab. learning

and performing simple but delicate tests. He has been taught to approach his patient confident of the aid of a wide variety of straightforward laboratory methods. But in General Practice he knows he will rarely, if ever, do a blood count, test for sugar only sometimes and never get a blood urea estimation without sending his patient to hospital.

Dr. John Hunt, the secretary of the new College of General Practitioners, suggested in his lecture\* a solution and a new standard for General Practice. His own "diagnostic unit," with a trained but supervised assistant, proclaims what can be done where five or more practitioners are able to share facilities and can be done sooner, more cheaply and maybe more effectively than by the N.H.S. clinics. The individual, he suggests, can train his secretary, as in America and on the Con-

tinental, to do blood counts and other simple tests.

His standard is merely that of the Hippocratic physician practised in the medicine of the 20th century. It was introduced to hospital practice when Dr. Horder first appeared at the bedside with his microscope. Now another Bart.'s man has shown us the way to apply it in General Practice.

If G.P.s are not in the near future equipped with "kitchens" and the time as well as the knowledge to cook in them, they may well become useful auxiliaries to a fine hospital medical service, but they will never develop that total diagnosis of the whole man, which it is the special privilege of General Practice to achieve.

\* Part of which appeared in the *B.M.J.* Dec 29th 1951, vol ii p.1575.

### The Coronation

*Dies valde pluviosa*—also on "a very rainy day," April 9, 1413, John Cok, the Renter of the Hospital, who, apparently, was fortunate enough to have a seat in the Abbey, saw the coronation of Henry V. On June 2, 1953, every patient who was well enough to sit, or have his bed moved into position, was able to take an intimate part in the crowning of Queen Elizabeth II, at Westminster. The provision of television for every firm was the prime way in which the hospital marked and celebrated the occasion.

The Governors generously presented every patient and every member of the hospital staff with a copy of Richard Dimbleby's book, "Elizabeth Our Queen," containing a handsome book plate. The Giltspur Gate was modestly decorated in blue, with some not very impressive flags.

No official lead was given at Charterhouse, but popular feeling was made all the more apparent by the informal bunting over the gate. The planners who so thoughtfully provided us in the College Hall with every material benefit cannot surely have been so materialistic as to leave us without a flag

mast? No doubt when the rebuilding is complete . . .

### Hat Trick

Mr. Geoffrey Keynes is now a Fellow of all three Royal Colleges. We congratulate him on his recent election as a Fellow of the Royal College of Physicians, a rare enough honour for a surgeon, but not so rare as this trinity of Fellowships, which is surely a unique distinction.

This *Journal* contains the first part of his Harveian lecture delivered to the Harveian Society of London earlier this year.

### Battles Long Ago

Those were the days, when Bart.'s footballers met the Arsenal at the Oval and beat them. Amateurs they may have been then, but it's a worthy battle honour. A photograph of the 1889-90 XI sent us with a letter from one of the team appears on another page. Besides our correspondent F. J. Dixon, at least two others—G. R. Fox and R. G. Hogarth are still alive. Both Dixon and Hogarth were in the team for the three years



ASSOCIATION FOOTBALL XI 1889-90

N. O. Wilson, A. E. Carruthers Mackintosh, J. Faber, G. R. Fox, W. H. Maidlow, R. G. Hogarth,  
A. W. Lemarchand, G. A. Coulby (Capt.), F. E. Fernie, Heny, F. Lewarne, F. J. Dixon

that Bart.'s held the London Amateur Cup.  
We wish these veterans well.

#### Prizes

##### *Wix Prize*

Awarded to: D. P. THOMAS

##### *Hichens Prize*

Awarded to: W. SANFORD

##### *Treasurer's Prize*

Awarded to: J. N. GRAHAM-EVANS, Aeq.  
A. R. O. CHINERY

Certificate to: D. G. BILLARDIS

*Junior Scholarships in Anatomy and  
Physiology*

1st Scholarship: Not awarded

2nd Scholarship: A. R. O. CHINERY

#### Clinico-Pathological Conference

The pathology classroom is, as even a pathologist would admit, an unemotional place, respectable but shabby. Yet, on Wednesday, May 27, it was so crowded that there was standing room only. Bursts of cheering agitated the cobwebs, and there was an audience as excited as children at a Christmas conjuring show. This was the first Clinico-Pathological Conference to be held in Bart.'s for twenty years.

Before the conference began, a typewritten case history was distributed. Professor Christie took the chair at 1 p.m. Dr. Bodley Scott gave his opinion and committed himself to a diagnosis (*cheers*). Reports were given by the different departments. Dr. Oswald then sportingly offered an opposing



diagnosis (*cheers*), adding enormous excitement. Finally, the P.M. findings were dramatically revealed (*resounding cheers*).

These conferences lapsed between the wars, because they were not sufficiently exciting. It was not always possible to ensure that the physicians were unaware of the P.M. findings and the audience was but little interested in hearing the chiefs faultlessly delivering the right answers. The present system though, with the P.M. findings kept a secret until the physicians have firmly committed themselves, is certain to provide a tense hour. The conferences are still experimental and the departments concerned (the two Units and the Pathology Department), would welcome any suggestions. How, for instance, are the clinical details best circulated to students? This time four sheets were left in the A.R. Is this sufficient? The conferences are intended for students, and if the notes are available, they might find it fun trying to make a careful armchair diagnosis on the night before. Would "Consultations," an honourable name never likely to be used again in its old sense, be as apt as the cumbersome phrase "Clinico-Pathological Conference"?

As Professor Christie remarked, 1 p.m. is a bad time for the staff, and the pathology classroom is too small. In future the conferences will be held at 12.15 p.m., in the large clinical lecture theatre, on the first Wednesday of the month.

We admire the courage of the staff in publicly committing themselves. Here, perhaps, in these conferences, will be found a way in which the hospital can prove its spirit and its entity.

### View Day

Nationalisation, call it what you will, has not robbed us of our time-honoured right to keep annual saturnalia and, in theory, if not in fact, to let the patients come second, just for once. But if we only knew, their enjoyment of View Day probably comes little short of ours. To us they are only the dim backcloth of scrubbed faces and carefully parted hair against which we play our short but heady act (with all the dignity that teacups and chocolate biscuits will allow). To them—a select audience reclining luxuriantly among banks of flowers and foliage—we, with a new set of manners, a colourful escort and, for once, with our hair, at least meta-

phorically down, must present an intimate and revealing entertainment.

Steering our relatives and friends from department to department, we admired in the library an unknown medical student and watched on a screen the evidently erratic progress of building the College Hall. We goggled at leeches in the Great Hall, were charmed by the new Physiotherapy Department, and cheered in the Photographic Department by records of how the grosser forms of exophthalmos will respond to X.R.T.

But the essential people on View Day, as on every other day, are the nursing staff. Plundering Covent Garden in the small hours—and what little resistance can have been offered—organising an impressive catering service on top of their usual work, kept on duty long over time and unable to roam the hospital like us in their best clothes and favourite company, we hope they enjoyed it even so—we did, tremendously!

One old Bart's man making his first visit to the hospital for eighteen years was our most regular and most light-hearted contributor, a former editor of the *Journal*, Brig. R. B. Price, D.S.O. This month our shortest, but sweetest, contribution comes characteristically from him.

### Treasures and Archives

For five days in May and the first time in 800 years the hospital's treasures and archives were on public view, worthily shown in James Gibbs' Great Hall. Eleven hundred people came to see them.

Here were our great documents and charters dating from 1137, a notable collection of medieval seals and the writings and memorials of Pott and Paget. Here were chalices and flagons in fine seventeenth-century silver and pipkins and porringers from half a dozen centuries down to John Gow's new almsdish and cruets lent by the Hospitalier.

Mrs. Whitteridge, Miss Stokes and Mr. Thornton spared themselves no pains. This was no casual display of rich frontispieces, and the merely quaint: careful labelling demanded a serious interest, but a seriousness met again and again half way with humour. Live and work as they may do among heaps of calfskin and mouldering manuscript, in an artificial atmosphere and under artificial light, there's nothing dry-as-dust about archivists.



**Dr. Gow**

A memorial service to Alexander Edward Gow, M.D., F.R.C.P., was held in St. Bartholomew's-the-Less, on Sunday, April 12.

The Hospitaller dedicated the almsdish and pair of cruets given to the hospital in his memory. This fine memorial, the work as well as the gift of John Gow, his brother, is of silver and blue enamel. They were much admired while on view in the Great Hall on View Day.

solitary student to be identified with the whole medical profession in England and in a national daily at that, with a daily circulation of over four million, is, we claim, a unique if somewhat unnerving event.

When the *Daily Express* came out with the headline "Mrs. Dale 'so degrading' say the doctors" the *Journal* had at last achieved fame—of a kind. It didn't really matter that our whimsical attack on this hardy perennial had been taken seriously. It didn't



THE GOW MEMORIAL ALMSDISH

A consulting physician to the hospital who retired in 1946, Dr. Gow is best known to present students as the co-author with Lord Horder, and latterly, with Dr. Bodley Scott, of that not well enough known book, *Essentials of Medical Diagnosis*.

**Mrs. Dale's Diary**

It is an experience common to all medical student editors of hospital magazines to be addressed, sooner or later, as "Doctor" by some unknowing correspondent. But for a

matter that we had been misquoted and our tenses mixed up. It didn't matter that we were placed in the van of a "Down-with-Dale movement" which, we feel sure, does not exist and was cooked up for the occasion. There we were—quoted at some length and in all seriousness, our words, written for 2,000, read by four million! When the hue-and-cry was taken up by *Illustrated* a week later, our cup of joy was full to overflowing. Overnight the *Journal* had become one of the mighty organs helping to mould British public opinion.

The letters flowed in, thick and fast, all three of them. Only one, from a regular reader of ours, was polite enough to be printable. One was from a lady in Liverpool who was obviously a candidate for the care of Dr. Strauss. She gave us a full account of the disastrous encounter of her own family with G.P.s, lashing us with every paragraph, and ending up, "Yours, with contempt." Another lady, writing from Watford, was less aggressive and more subtle, but gave the game away by suggesting that we should find something better to do with our time than listening to Mrs. Dale!

As all these people insist on taking us seriously, we must defend ourselves. He would be a brave man who suggested that the level of conversation in a G.P.'s home was any higher than in Dr. Dale's. We all have our family rows, disasters and skeletons in the cupboard. But it is precisely for that reason that we don't want to hear about Mrs. Dale's. The functions of the B.B.C. are to instruct, to educate and to entertain us—and *not* to play back to us a modified version of our own humdrum lives.

We are sorry if we have offended the wives of some of the senior staff. But not one single inch will we retreat. Mrs. Dale's Diary is nonsense.

### The Women's Guild Draw

On Wednesday, April 29, the Women's Guild held their long-heralded and anxiously awaited draw. It took place after the annual general meeting of the guild, and was made by the Lady Mayoress, ably backed up by Lady Aylwen.

The plum among the prizes, the English Electric refrigerator, fell to a Miss Robeson, of Ealing, the case of champagne to a gentleman in Osterley, and thereafter, so it seemed, all the feminine prizes such as permanent waves and bedjackets were won by men, while masculine prizes like razor sets, whisky and stout, went to those who shouldn't use them. Everyone was delighted—and no one more than Lady Ross—when Sir James Paterson Ross won a pair of nylons.

No one really expected to win anything, and those who did were most agreeably surprised—perhaps even the undergraduate of Keble College, Oxford, who won one dozen 4-pint tins of white enamel paint. What is far more important is that the draw netted

over £700 for the Women's Guild—a most handsome sum with which to carry on its excellent work for the next year.

### Coronation Ball

This was by far the most ambitious social event of its kind that the Students' Union has ever sponsored, and it was magnificently successful. From 11 p.m. till 5 a.m. 1,200 dancers enjoyed the music of Geraldo, and, between times, the cuisine of the Festival Hall. Only the weather, which seems to have dogged the Coronation celebrations from the beginning, failed to come up to expectation, and intermittent rain throughout the night not only emptied the terraces but spoiled what promised to be highlights of the evening—the boat trips up and down the Thames.

At 11.30 we were honoured by the arrival of the Lord and Lady Mayoress, both still contriving to look fresh and remain charming despite an exhausting day of social engagements, beginning with the Guildhall luncheon to the Queen. They were greeted by Mr. and Mrs. Naunton Morgan, and a bouquet was presented to the Lady Mayoress by Miss Lorna Fletcher. At midnight, Mr. Naunton Morgan made a speech before giving the Loyal Toast. He dwelled felicitously on the close association of St. Bartholomew's both with the Crown and the City of London, and read out the loyal greetings sent in our name to Her Majesty, and her gracious reply. Her health was then drunk with a will, and the dancers returned to the floor. The evening continued hilariously on its way with eight-some reels, the Gay Gordons, sambas, tangos, rumbas, and all the more conventional and less energetic dances. It proved a most cheerful, contented and well-behaved party.

The behind-the-scenes work that goes into these events has to be experienced to be believed. The planning started long before last Christmas and for the final month the three ball secretaries, Miss L. Fletcher, L. N. Dowie and J. Copplestone have been seen doing little other than organising our entertainment. They were most ably helped by Bert Cambridge and Miss Wynn, and to all five of them we who enjoyed the ball so much give grateful thanks.

### Journal Appointments

I H. Backhouse and S. P. Lock have resigned their appointments as joint Editors.

R. E. Nottidge has been appointed Editor and Griffith Edwards, Assistant Editor. Miss N. Coltart has been appointed Charterhouse Representative on the Publication Committee.

#### Congratulations

To Dr. A. A. Miles, Director of the Lister Institute of Preventive Medicine, awarded a C.B.E. (Civil Division) in the Coronation Honours.

To Dr. R. R. Powell of Redhill, awarded an M.B.E. (Civil Division) in the Coronation Honours.

To Mr. James Andrew, Registrar to the "Midder and Gynae" Department on being awarded the Green-Armitage Short-term Travelling Scholarship of the Royal College of Obstetricians and Gynaecologists. He is going for three months to a post in Vienna.

To Angus Luscombe on his engagement to Miss Ann Wickham.

## HARVEY AND HIS BOOKS

by GEOFFREY KEYNES

*Being the Harveian Lecture delivered to the Harveian Society of London, in March, 1953*

The subject of this lecture was suggested to my mind by the fact that a second revised edition of the *Bibliography of William Harvey* is about to be published by the Cambridge University Press. The title is somewhat ambiguous. "His books" might mean the books he wrote or the books he possessed, but the ambiguity suits my purpose of saying something on both subjects, though much less on his possessions than on his writings.

Harvey was in the succession of learned medical men who included Thomas Linacre and Dr. John Caius before him. The designation "learned man" implies familiarity with the writings of earlier doctors and with the classics and therefore, since there were no institutional libraries in the sixteenth and seventeenth centuries, the possession of a considerable library of books. I think it may be assumed that Harvey was well provided with books, but unfortunately we do not possess any ocular proof of this, two catastrophes having destroyed the greater part of his private accumulations. The first was in 1642 when Harvey was absent from London in attendance on the King. As a known Royalist he was an object of sus-

picion to the Parliamentary mob, who broke into his lodgings in Whitehall and stole or destroyed all his belongings, including his scientific papers. The second disaster was in 1666 when the library which Harvey had built and furnished for the College of Physicians was destroyed in the Fire of London. So it comes about that we have virtually no knowledge of what books Harvey may have possessed or used beyond the references in his writings. Only three volumes in all are known at the present time. One of these the *Opera Omnia* of Fallopius, Frankfurt, 1584, fo. has remained in, or has been restored to, the Royal College of Physicians. It has the signature of Lancelot Browne, Harvey's father-in-law, on the title-page, and marginal annotations throughout, many of which are in Harvey's hand, but chiefly in the section *De metallis seu fossilibus*. A second volume, in the British Museum, is Galen's *Opuscula Varia*, translated from Greek into Latin by Dr. Theodore Goulston, 1640. There are marginal annotations in Harvey's hand, and against one passage referring to civic honours and distinctions he has made the contemptuous comment "Woodden legges." The third and almost

fabulous book is *De febribus commentarius* of Sylvius, Venice, 1555. It has extensive marginal annotations in the hand of the great Fabricius ab Acquapendente and the signature of his pupil, Will. Harvey, written with unusual care and dated 1621. As if that was not enough, it has also the signature of Dr. Richard Mead, the greatest medical book-collector of the eighteenth century as well as one of the most successful doctors. I vividly remember first seeing this extraordinary book, when Dr. Erik Waller, the Swedish surgeon, produced it out of his pocket as I was washing up for an operation at St. Bartholomew's some years ago. I could hardly believe my eyes then and have some difficulty in doing so now. The book is now in the Bibliotheca Walleriana at Uppsala University—where Dr. Waller has deposited his splendid medical historical library. That is the sum total of books surviving from Harvey's library that are known at the present time, except for a copy of one of his own books to which I shall refer again presently.

It is to be noticed, as it perhaps sheds a little light on Harvey's aloof character, that no copy is known of any of his three books given by him to any of his friends. This is unusual among seventeenth century writers, since nearly always several presentation copies of their books, often in special bindings of red morocco, are known to book collectors. The good Izaak Walton is certainly the most generous character of the seventeenth century of whom I have any knowledge. He gave copies of his famous *Lives* to almost everyone he knew. Harvey was different.

We may lament the fact that only three books by other writers have survived from Harvey's library. It is even more regrettable that only three books from Harvey's pen are all that he chose to leave us, since so powerful and so original a mind as his could surely have given the world still more valuable matter had he so chosen. It is to be remembered, however, that it was not his nature to be prolix, and that he was not eager to share his thoughts with anyone. He never laboured for notoriety and took a somewhat contemptuous view of his fellow men. He once remarked to John Aubrey that 'Man is nothing more than a great mischievous baboon', and he can hardly have thought it worth while to take much trouble to communicate his private thoughts to the idiots

## EPISTOLA

Ad Candidum lectorem.



NIVERSAM febrium naturā  
cognoscere, non medico soli, sed reli-  
quis quoque hominibus utile admo-  
dum est, ac etiam necessarium, ut  
certa methodo curet: his autem præcon-

ueant, et febrem curati medico morem gerat. Quid? Febres quæ  
febris ipsa, maribus sit et frequentissimas, et sepe ac-  
tissimas, vel acutis prope omnibus morbis contextus, et  
qua maximum vite periculum non raro impendit.  
Adde quod reliquum morborum plurimum aucta tantum  
actione leuatur, animalium scilicet, aut utile, aut natura  
le febribus vero omnes actiones has ois leuatur: hoc est de febribus omni-  
bus, ut vel deprimatur, vel aboletur, quæ tam tamen magis, ut non  
quædam minus. Quin et bellius ipsam furiosam febrem, vel ad id  
actiones ipsas leuatur, non solum uolentia et feracitate  
ac malignitate, sed etiam suorum symptomatum tam  
molestitudine, quam magnitudine. Ut quibus tam leui-  
bus, tum grauius et acerbioribus ac uita pericu-  
lum imminantibus, potius iussum attenti sumus. Quia  
propter opacior febrem cum morborum omnium ma-  
lignitatem et sauiussum lumen, ne nocere, Romani  
coluisse dicuntur. Hic porro commentarium ex duo-  
bus rei Medicæ clarissimi luminibus, Hippocrate et  
Galeno eius interprete absolutissimo excerpte ma-  
a q lue

Harvey's signature and Fabricius' annotations on a page of Sylvius.

that surrounded him. Everything that we know about him points to the same thing.

The three books that Harvey published were *De Motu Cordis*, 1628, *De Circulatione Sanguinis*, 1649, and *De Generatione Animalium*, 1651.

The great physiologist, Robert Boyle, in one of his many books obligingly recorded a brief conversation with Harvey. "And I remember that when I asked our famous Harvey, in the only discourse I had with him, (which was but a while before he died) what were the things that induc'd him to think of a *Circulation of the Blood*? He answer'd me, that when he took notice that the Valves in the Veins of so many several Parts of the Body, were so Plac'd that they gave free passage to the Blood towards the Heart, but oppos'd the passage of the Venal Blood the contrary way: He was invited to imagine, that so Provident a Cause as Nature had not so Plac'd so many Valves without Design: and no Design seem'd more probable, than that, since the Blood could not well, because

of the interposing Valves, be Sent by the Veins to the Limbs; it should be Sent through the Arteries, and Return through the Veins, whose Valves did not oppose its course that way." \*Boyle wrote this in 1688, more than thirty years after Harvey's death, and we cannot suppose that this rather breathless sentence records Harvey's actual words; but Boyle has no doubt conveyed his meaning accurately enough.

Harvey had entered the University of Padua at the age of 25 in 1598, and remained there until 1602. During these four years he was the pupil of Fabricius ab Aquapendente and also became his friend—one proof of this being the book already described which was presumably given to Harvey by his master in 1621. In 1603, just after Harvey left Padua, Fabricius published a folio tract on valves in veins entitled *De Venarum Ostioliis* and it is therefore clear that Harvey must have had his attention very forcibly directed to those structures during his anatomical studies. One can imagine some of the awkward questions the intelligent and logically minded pupil must have put to his rather old-fashioned teacher, and, once out of the range of his damping answers, the young man proceeded with investigations on his own lines which culminated in the brief treatise embodying his conclusions. This he called an "Anatomical Exercise," a modest name for the conclusive and clear-cut record of the first modern experimental investigation of a fundamental problem in physiology.

Harvey is often described as "the Discoverer of the Circulation of the Blood," suggesting that he stumbled suddenly and accidentally upon the truth. But in fact his conclusions were only reached after prolonged and painstaking investigations, his observations being made both on his patients and in the course of dissections and experiments on animals. He may have suspected the truth at Padua, but it was not until fourteen years later that he put the results of his work down on paper. He must have reached his main conclusions before he was forty, but it was his appointment to the office of Lumleian Lecturer at the College of Physicians in 1615 that determined the writing of his *Praelectiones* which are dated 1616, that is, when he was forty-three. We are so fortunate as to possess in the Manuscript Department at

the British Museum the notes for these *Praelectiones* written wholly in Harvey's hand.

These are the immortal pages on which Harvey has scrawled his brief notes in a curious mixture of English and dog-latin to remind him of what he had to say in the course of his lectures on anatomy. He usually put his monogram, WH, in the margin against any passage which he regarded as specially important, as, for instance, the following:—

W.H. constat per fabricam cordis sanguinem  
Per pulmones in Aortam perpetuo  
transferri, as by two clacks of a  
water bellows to rayse water  
constat per ligaturam transitum sanguinis  
ab arteriis ad venas  
unde perpetuum sanguinis motum  
in circulo fieri pulsu cordis.

(leaf 80, verso.)

It has been claimed that this page was written with a different quill, and so at a different time, from the rest of the *Praelectiones*, and this may be held to accord with the statement made by Dr. Henry Power in a contemporary MS that Harvey invented the circulation of the blood in 1614, or two years before the usually accepted date. Be that as it may, the Lumleian Lectures were on general anatomy and were given in a two-year cycle, so that six times in the twelve years up to 1628 was Harvey's message given to a fresh audience of students before he saw fit to allow his pamphlet to be distributed in print. How many of his audience in those twelve years ever realised what it was they were privileged to hear? Did they raise shocked eyebrows as they listened to their unorthodox lecturer, and did they go into a huddle afterwards for eager discussion of the scientific bombshell that had exploded in their midst? Of course it all depends on how Harvey put it, but we may be sure he never dramatised his theme or raised his voice to emphasise the fact that he was demolishing the inconsistent beliefs held by his predecessors for a thousand years or more. Perhaps the students, like most students at anatomical lectures to the present day, were half asleep, and missed the implications of what their swarthy and rather contemptuous little lecturer was saying to them. It seems to be clear that the news of Harvey's novel teaching was not carried far abroad, for no sound of controversy on the subject of the circulation was heard before the publication of his treatise. As far as is known no students' notes made

\* *A Discourse about the Final Cause of Natural Things*, London, 1688, pp. 157-8.



at Lumleian Lectures have survived, so that there is no evidence whatever that the new doctrine had made any impression on those who heard it.

It remained, then, for the ultimate publication of *De Motu Cordis* in 1628 to carry Harvey's teaching to the wider audience which could appreciate and dispute the frontal attack that was being made upon established beliefs.

It is not my purpose to examine in detail the claims of Harvey's conception of the circulation of the blood to novelty, or its precise relation to Galenic theory, or to make another attempt to prove Harvey's priority and to confute the spurious claimants to this honourable position. All this has been done many times by medical historians of far greater learning than mine, and need not be repeated. It is, however, perhaps worth pointing out that the chief value of Harvey's book does not necessarily lie simply in his announcement of the facts of the circulation of the blood. His announcement of the facts was, indeed, incomplete, because he was unable to see, or even to imagine, the capillaries in the lungs, so that an important link in the chain of statements was missing. The real importance of the book lies in its being the first demonstration of scientific method in biological research, and it is on this quality that its pre-eminence is so securely founded.

It is not, I think, making too great a claim to state that Harvey's *De Motu Cordis* is one of the most fruitful and important books ever published. It ranks with Galileo's work on the system of Copernicus, Newton's *Principia*, and Darwin's *Origin of Species*.

Having made this large claim for Harvey's book as a milestone in the history of human thought and endeavour, I now wish to turn to the consideration of it as a material object and of the circumstances of its publication. Surprise and puzzlement have often been expressed because the book was entrusted to a young publisher called William Fitzer at Frankfort-on-Main. It has been suggested that Frankfort was chosen because of its annual bookfair and because the book was written in Latin, the international language. But most scientific and medical works were written in Latin at that time, so that the language employed does not seem to be an adequate reason. As long ago as 1929, Dr. Archibald Malloch, librarian to the New York Academy of Medicine, suggested that the real reason for Harvey's choice was his

friendship with Robert Fludd (1576-1637), a celebrated London physician of Harvey's own age. More recently the facts have been fully investigated by a learned bookseller, Dr. Weil, who has pointed out that Fludd, the author of many books, had from 1617 employed as publisher de Bry of Frankfort. In 1626 de Bry died and his business passed into the hands of William Fitzer, who was, in fact, an Englishman, though he worked in Frankfort. Fitzer then took over the publication of Fludd's works, so that Fludd would naturally recommend him in 1628 to Harvey, who was then publishing his first book and was no doubt open to advice from his more experienced friend. Fludd and Harvey had been acquainted for many years, having been students together at Padua in 1602, and Fitzer's handling of Harvey's brief treatise seems to follow as a natural consequence.

Publication in Frankfort did, however, have one very unfortunate result. Distance and difficulty of communication probably prevented Harvey from seeing any proofs of his book, although it was exceptionally important that he should have the opportunity of making corrections owing to the illegibility of his hand. It is true that in those days typographical accuracy was not regarded with the (perhaps exaggerated) importance that we attach to it now, but even so it seems unlikely that Harvey would have passed the 126 errors which were listed on the errata leaf added to part of the edition of the book. Even then the list was incomplete, the first properly edited text of *De Motu Cordis* containing 246 emendations.

Harvey did not waste words and this immortal work was contained in only sixty-two small quarto pages. The whole book, with its title-page and dedications to King Charles and Dr. Argent, consists of only thirty-six leaves, afterwards increased to thirty-eight by the addition of the errata. The greater part of the edition is printed on paper of very poor quality; usually it has turned brown and is crumbling, so that not many copies seem destined to survive. Not many have, indeed, survived to the present day. *De Motu Cordis* is not a book of extreme rarity, but only forty-five copies can be discovered by Dr. Weil's careful enquiries in England and America and in continental libraries. Of these forty-five, only fifteen are in Great Britain, not one of which is in private possession. No copy has been sold



in a London auction room for very many years. A long time ago a stranger sent me a copy for advice as to disposal, but, perhaps foolishly, instead of buying it myself, I sent it on to a London bookseller, who soon disposed of it in America at a very large profit. I am glad to say that one of the fifteen British copies is likely to survive for a longer time than most. It seems that part of the edition was printed on thick paper of very good quality, three of these special copies being now known to exist. One is in the Hunterian collection at Glasgow, and there can be no finer example in existence. An eccentric old student of St. Bartholomew's Hospital, Dr. Sydney H. Badcock, who spent a great part of his life collecting engraved portraits of Harvey, used to say that in the old days *De Motu Cordis* could be bought for sixpence in the Farringdon Road, and it was popularly believed that he kept two copies, one of them untrimmed as issued, in a box under his bed. After his death, however, this proved to be a legend, or an idle boast, and it is a very long time since anyone had such luck in the Farringdon Road.

The title-page of *De Motu Cordis* is made to look rather distinguished by being largely occupied by Fitzer's showy device, carrying his monogram.

The well-known engravings of valves in veins, with which Harvey illustrated his thesis, were not original, but were obviously based on one used by Fabricius in his book entitled *De Venarum Ostiolis*, published in 1603 and again in 1624. Harvey made no acknowledgment of this, but he also made no pretence of priority in his description of the valves, and the debt to Fabricius was probably too obvious to need comment. The hand and arm in the engraving is grasping a barber's pole as for blood-letting.

*De Motu Cordis* had been reprinted eight times by 1660, though always for continental booksellers, and it was not until that year, three years after Harvey's death, that it was first printed in London. In 1653, however, an English version had been published, translated by an unknown hand, and this was reprinted in 1672. From that time the contemporary version was ignored, the standard text in recent times being the rather tame and stilted rendering published by Dr. Robert Willis in Harvey's *Works*, in 1847. This may be more accurate than the earlier text (though certainly not always), but it is

much less interesting to read. I, therefore, took the opportunity of reviving the contemporary version in 1928, the tercentenary year, by editing it for the Nonesuch Press, and it is to this edition that most references are now made. For some reason unknown neither of the original editions in English contained the illustrations. This omission I remedied by having the figures redrawn (incidentally, from the arm of an orthopaedic surgeon), by Stephen Gooden, R.A., the well-known copperplate engraver, who has recently completed two lovely book plates for the Royal College of Surgeons.

Harvey's treatise has, of course, been translated into many other languages. The first to be done was into Dutch, published in 1650, though the translator tactlessly included a poem on Harvey's death seven years before he died. Harvey was of a sardonic turn of mind, and probably enjoyed the joke as much as anyone.

Those who like statistics, may be glad to know that *De Motu Cordis* has been printed twenty-three times in Latin, eleven times in English, once in Dutch, twice in German, once in Danish, three times in French, twice in Spanish, and twice in Russian. The Dutch and English translations were the only ones done in Harvey's lifetime.

Harvey's thesis naturally aroused a great deal of adverse criticism, and many years later he said to Sir George Ent, "You know full well what a storm my former lucubrations raised. Much better it is oftentimes to grow wise at home and in private, than by publishing what you have amassed with infinite labour, to stir up tempests that may rob you of peace and quiet for the rest of your days." He long remained true to this reserved attitude, and published no reply to his critics until in 1649 he was goaded into doing so by the writings of John Riolan the younger, professor of anatomy in Paris. Riolan's book was published in 1649, and Harvey's reply followed quickly in the same year. This, his second book, was first printed in Cambridge, again in the same year in Rotterdam, and a third time in 1650, in Paris. All these books are much more uncommon than the first edition of *De Motu Cordis*, but the work is, of course, of only secondary importance, and does not command nearly such a high price. The two best copies that I have seen are in the University Library, at Cambridge, and were bought by Francis Jenkinson, a former librarian, for 3s. 6d. and 4s.,

respectively. The present-day price would be nearer £150, but even that does not approach the eight or nine hundred pounds that would be needed to secure a copy of *De Motu Cordis* if ever it turned up.

Harvey's little book is written in two exercises called *De Circulatione Sanguinis*, and

it betrays a certain degree of irritation with his stupid disbelieving critics, but it is to be regarded only as an appendage to his first book, and since 1652 has never been printed apart from it.

(To be concluded)

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## EVENING STORM

With a rush it was upon us,  
Even as the sighing died in the air,  
Trees knelt down with fury to the wind,  
And branches broke in the shadow,  
Came hail to lash the mountainside,  
And stone corries  
Laid bare beneath the cold compress of night,  
Raging spindrift  
Tossed with the moon to the tune of the gale,  
Cruelly, drove cruelly the sheep,  
Down, down the valley  
And the long avenues of night,  
Borne out in the ventless sky,  
To a restless haven of sleep,  
Where rain pitted against the fold,  
Even till the early hours of dawn.

D. C. A. M. POLLARD.

## SO TO SPEAK . . .

### Flood relief ?

"The relations of the Hospital and Priory were examined and the two inundations were finally separated . . . in 1537."

—*College Handbook*, 1952-53.

### The exception proves the rule

"Death from haemoptysis in Tubercle very rarely occurs except as a terminal event."

—*Assistant Physician*.

### During a Colectomy

"Now we 've only got to go round the bend."

—*a flexure of speech ?*

## DESERT ISLAND DISCS

Do these castaways count on lumbago and back-ache

Among other nautical risks?

They do seem to suffer, to judge by their records,

From rather degenerate discs!

R. B. P.

## WATER AND ELECTROLYTE BALANCE IN SURGICAL PATIENTS

By P. F. JONES, F.R.C.S., *Surgical Tutor*

IN 1938, the *Saint Bartholomew's Hospital Reports* contained an article by Dr. Avery Jones and Mr. Naunton Morgan on "The Post-operative Administration of Fluids" which should still be read by any one interested in the subject. Since then much work has been done in this field and views have to some extent changed. It is the aim of this article to summarise present-day theory and practice.

Water and electrolyte exchange is a constant process in which, in health, gain and loss are balanced. Water, electrolytes and other foods are ingested and absorbed into the blood plasma. In this they circulate and in the capillary loops much of the plasma filters off into the tissue spaces where it is called interstitial fluid. Together, the blood plasma and interstitial fluid make up extracellular fluid: they are in virtual continuity and are identical in composition save for the almost complete absence of protein from interstitial fluid. Interstitial fluid circulates through the tissue spaces and bathes the surfaces of the body cells. Substances needed by the cells pass across the cell membranes into intracellular fluid and waste products move in the opposite direction. At the venous end of the capillary loops interstitial fluid is reabsorbed into the plasma. The excretion of water, electrolytes and waste products is ordered by the kidneys, which are the controllers of extracellular fluid composition.

This outline contains the basis of water and electrolyte balance, for normal cell life depends on the constancy of the composition of intracellular fluid and this in turn depends on the normality of the extracellular fluid which supplies it. The purposes of water and electrolyte therapy are to correct any abnormalities of these body fluids preoperatively and to maintain their normality post-operatively.

### WATER

Water is taken both in food and drink, an ordinary "solid" diet contributing about one

litre of water to the daily intake. Water is lost from the body by four routes, the loss by three of these—skin, lungs and faeces—being insensible. An adult loses each day about 100 ml. of water in faeces, 400 ml. by evaporation in the respiratory passages and, even in the coldest weather, 400-600 ml. of sweat: a total insensible loss of about one litre of water daily. The remainder of the normal water loss occurs in the urine and a patient with normal kidneys should drink enough water to produce 1—1½ litres of urine daily, although the irreducible minimum in which the urinary solids can be excreted each day is 500 ml. This means that a patient on parenteral fluids needs at least 2½ litres of water daily to meet ordinary insensible and urinary water losses.

When water intake falls appreciably below 1½ litres per day obligatory losses of water will exceed intake and the patient will become dehydrated and thirsty. In this state water is withdrawn from all tissues of the body to maintain the obligatory water losses: in a total water deficit of 3 litres, 2 litres will be lost from intracellular fluid and 1 litre from extracellular fluid. Such a deficit may be seen in severe dysphagia or in a patient too weak to drink.

### THE ELECTROLYTES

Analysis of extracellular and intracellular fluids reveals a great difference in their electrolyte composition (Fig. 1).

#### A. Sodium and extracellular fluid.

Extracellular fluid contains much sodium and chloride, appreciable amounts of bicarbonate and very much smaller quantities of the intracellular electrolytes. All these constituents have their functions.

##### 1. Supply of salts essential for cell life.

The cells require certain electrolytes to be present in certain concentrations in extracellular fluid. Ringer showed in 1883 that the fluid used for perfusing the isolated frog's

heart must contain exact amounts of sodium, potassium and calcium salts.

## 2. *Osmotic pressure of body fluids.*

The cells contain proteins and electrolytes in an aqueous medium and the cell envelope acts as a semi-permeable membrane. The osmotic pressure thus created is balanced by the osmotic pressure of extracellular fluid. As the interstitial fluid which bathes the cells contains little protein its osmotic pressure derives from the electrolytes in solution in it. Of these the sodium kations are the most important. This should be remembered as the extracellular electrolyte most often referred to is the anion chloride. This is not because it is more important than sodium but because it is easier to estimate in body fluids. As sodium chloride is the chief salt of extracellular fluid, chloride concentration does provide a fair guide to the sodium concentration in this fluid.

Extracellular fluid osmotic pressure is, therefore, directly related to the concentration of sodium salts dissolved in it, and this is regulated in two ways. First, changes in extracellular osmotic pressure are followed by the passage of water across the cell membrane, which diffuses concentration changes throughout the body fluids. Second, correction of changes in osmotic pressure is effected by the kidney which alters the quantities of water and sodium excreted in the urine.

The following case history demonstrates the efficiency of these mechanisms and how the body will threaten even its existence in the process of preserving the constancy of extracellular osmotic pressure.

### *Case 1.*

For some weeks during the summer of 1945 the midday shade temperature in the South Iraq desert reached 120 deg. F. During this time a soldier of 21 years was seen with a history of progressive weakness for one week, culminating in his collapse shortly before admission. He did not complain of thirst, said he had been drinking tea and squash freely and had passed normal quantities of urine. His eyes were sunken, the skin inelastic and cool and the systolic blood pressure was 50 mm.Hg. When he sat up he fainted. The oral temperature was 99 deg. F. The striking feature of this patient was that though he had been drinking freely he was in severe oligæmic shock. The reason was that the climatic conditions demanded the evaporation of large volumes of sensible sweat. Thirst had prompted him to drink but nothing had reminded him to replace the salt he was losing. The fall of the extracellular sodium concentration had resulted in loss of water to the cells and increased excretion of water in the urine. Together these processes

had preserved the osmotic pressure, but at the expense of a dangerous depletion of extracellular fluid volume.

This specific depletion is the chief feature of sodium deficiency and when the reduction in volume is sufficient the blood pressure will fall and signs of subcutaneous dehydration appear—an inelastic skin and a pinched face.

In surgical practice it is rare to see a pure deficiency of sodium because it is almost impossible to make a patient sodium deficient by deprivation of sodium. Sodium deficiency in surgical patients is almost always due to loss of gastro-intestinal secretions by vomiting, diarrhoea, fistulous discharges or gastric suction. As the sodium in gastro-intestinal secretions is in aqueous solution water must also be lost in these cases and they show mixed deficiencies of sodium and water. Case 4 provides a good illustration of this. A full and clear description of water and salt depletion is given by Marriott (1950).

## 3. *Acid-base balance.*

Mammalian cells cannot tolerate wide variations in the reaction of body fluids. Provided there is normal renal function, acid-base balance is preserved but in the few surgical patients with impaired renal function this matter needs careful attention.

## **B. Potassium and intracellular fluid.**

Eight years ago little was known about intracellular metabolism and few clinicians recognised that the body could be affected by a deficiency of potassium, the principal intracellular kation. In 1946 Darrow and Govan showed that in infants with gastro-enteritis who were given parenteral potassium chloride as well as sodium chloride the mortality rate was substantially reduced; they proved that much potassium had been lost in the stools. Since then potassium has been intensively studied but many aspects of potassium metabolism are not yet fully understood. A summary of present knowledge is here attempted.

A normal diet supplies more than enough potassium, chiefly in meat, bread and vegetables: one pint of cows' milk contains 1.0 g. of potassium, about one third of the daily adult intake. After absorption, potassium circulates in extracellular fluid at a concentration of 15–20mg. per 100 ml., but in cell fluid a concentration of about 580 mg. per 100 ml. is maintained. Most intracellular potassium is in ionic form and participates

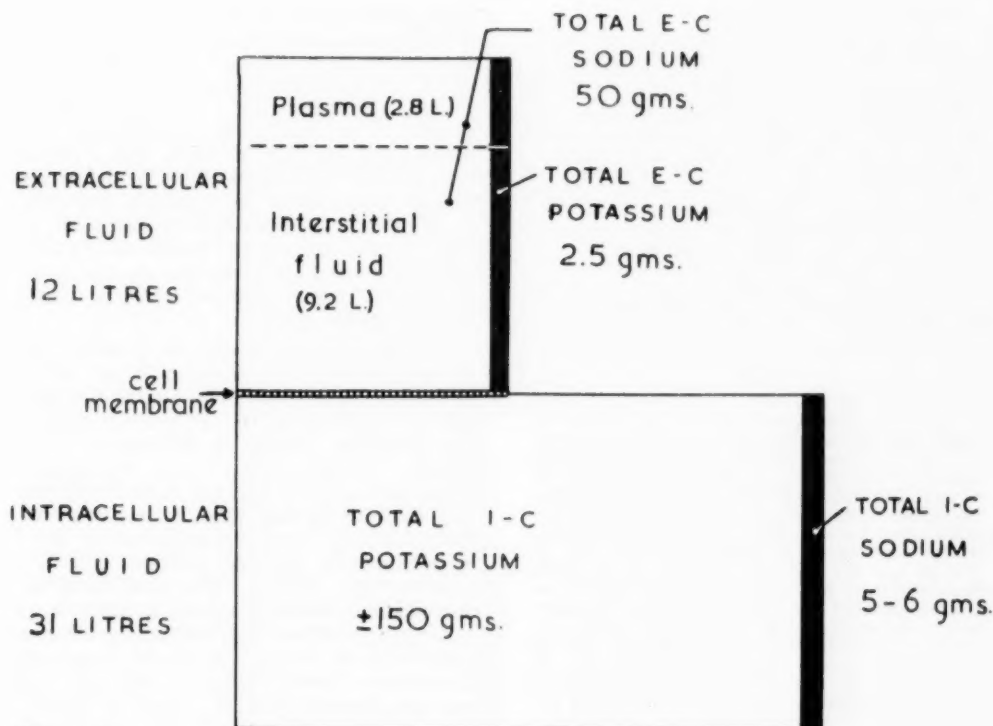


Figure 1.

*Diagrammatic representation of the distribution of sodium and potassium in extracellular and intracellular fluids. The volumes given for these fluids are those for an adult man of 70 kg.*

in many of the enzyme systems of the cells. One of the probable effects of potassium deficiency is interference with the action of these enzymes, resulting in impaired cell function.

There are several ways in which surgical patients may develop a deficiency of potassium:—

1. After operation potassium is not usually taken until oral feeding is recommenced. During this time urinary loss continues because the kidneys of a sick person do not effectively conserve potassium when intake is reduced, and the adreno-cortical response to operation increases the loss. About one-third of the potassium lost is associated with protein breakdown, but the rest is free potassium which leaves the cell to take the place of extracellular potassium lost in the urine.

2. Parenteral saline fluids are often given.

If an excess of salt is infused this sodium enters the cells and displaces potassium, which is lost in the urine.

3. The potassium content of gastro-intestinal juices is about twice the plasma concentration, so vomiting or gastric suction will cause additional potassium loss.

4. Previous malnutrition — not uncommon in obstructive disease of the alimentary tract — makes a post-operative potassium deficiency more likely.

The majority of surgical patients begin to eat 2—3 days after operation and the potassium in a normal diet soon repairs any deficiency. If feeding cannot be started as soon as this, as so often happens in abdominal surgery, it should be remembered that potassium is leaving the body and not being replaced. The following case histories suggest that a steady loss of this kind can be harmful.



*Case 2.*

A man of seventy years underwent posterior gastro-enterostomy for pyloric stenosis. Aspiration of the stomach tube post-operatively yielded increasing volumes of fluid, 1600 ml. being aspirated on the third day. In spite of sufficient intravenous normal saline the plasma chlorides were then 480 mg. per 100 ml. (See Appendix.) On the fifth day 1000 ml. were aspirated, plasma chlorides = 455 mg. per 100 ml., alkali reserve = 89 vols. CO<sub>2</sub> per 100 ml. and serum potassium = 14.4 mg. per 100 ml. The patient remained well but the hypochloraemia and alkalosis were unaffected by extra amounts of sodium chloride. 2.7 g. of potassium chloride were then given intravenously. The following day the plasma chlorides were 570 mg. per 100 ml. and aspirations were scanty. The patient made a full recovery.

*Case 3.*

A woman of sixty-three years with carcinoma of the vulva underwent a radical excision of the vulva and the inguinal and external iliac glands. She passed some flatus on the second day but thereafter she vomited intermittently and on the seventh day the abdomen was tightly distended and silent. The cause of this paralytic ileus was suppuration in the open retroperitoneal wound. At this time the serum potassium was 21 mg. per 100 ml. and the urine output only 500 ml. daily. Over the next few days the urine output rose and in spite of the supply of some parenteral potassium the serum potassium was 13 mg. per 100 ml. on the fourteenth day. At this time the patient was in water and sodium balance but she looked very ill, was drowsy and uncooperative and was so weak she could not move in the bed. The ileus persisted. That day 6 g. of potassium chloride were given intravenously and this dose was repeated on the following day, when the patient already felt and looked better. The next day the bowels were opened, the patient was bright and could move about the bed and take a light diet. Thereafter her progress was satisfactory.

Among the conditions with which potassium deficiency appeared to be associated in these patients were a persistent hypochloraemia with alkalosis which did not respond to normal saline, persistent gastric stasis and paralytic ileus, muscle weakness and prostration. It is certain that these patients were potassium deficient in that they had lost potassium in urine and gastrointestinal fluid and had not had it replaced and they both had low serum potassium values. It is equally clear that the signs mentioned rapidly improved when potassium was given. The effect in the second patient was particularly impressive as she had steadily deteriorated until then. A number of authors have described these signs in association with potassium deficiency (for example, Lans, Stein and Meyer, 1952) and it is probably correct to accept them as due to this deficiency. Nevertheless it is still

impossible to regard the effect of potassium deficiency as anything like so consistent as that of sodium deficiency and there is still controversy over whether it is extra- or intracellular deficiency of potassium which matters. Even less is known of the mode of action of potassium deficiency but it seems unnecessary to explain this exactly before giving potassium for the prevention or relief of the effects of deficiency. I can think of four surgical patients who I am sure owe their recovery to the administration of potassium. Black (1953) has written a valuable article on the subject.

The diagnosis of potassium deficiency by the recognition of particular physical signs is difficult. These may help, but a diagnosis will be most easily and accurately made if the potassium balance of the patient is estimated. A large number of observations have now been made on surgical patients showing that most adults submitted to a major operation lose daily 1.0–1.5 g. of potassium (2–3 g. of potassium chloride) provided there is a normal urine output. This figure does not include the potassium which is excreted in connection with protein breakdown. The intake will be known and so the potassium balance can be calculated. Additional help can be obtained from the serum potassium concentration, a low figure (less than 15 mg. per 100 ml.) indicating potassium deficiency. A normal serum potassium does not necessarily mean that the potassium balance is normal, for the extracellular potassium can remain normal for some time after an intracellular deficiency is established. Case 3 illustrates this point for there was only a slight fall in serum potassium concentration yet calculation of the balance showed a serious total potassium deficiency. An electrocardiogram will sometimes show an abnormal tracing but the serum potassium is usually low before this change is seen.

Having emphasised the importance of potassium metabolism it is most necessary to emphasise the dangers of indiscriminate potassium administration. Potassium given by mouth is safe but potassium given parenterally too fast in too high a dose can stop the heart. There are therefore four unbreakable rules for parenteral potassium administration—

1. There must be proper grounds for believing a deficiency of potassium to exist. A low serum potassium is generally reliable evidence but it is not always desirable to wait



for this—the knowledge that urine has been freely excreted and no potassium given for three or more days is usually a good reason for giving maintenance doses of potassium.

2. Potassium must not be given parenterally when it can properly be given by mouth.

3. Potassium should not be given unless there is a free output of urine. In an adult the daily volume should exceed 800 ml.

4. Not more than 0.5 g. of potassium should be given parenterally to an adult in an hour. The best way to give this quantity is to put 1.5–2 g. of potassium chloride (7.5–10 ml. of 20 per cent. solution) into a pint (540 ml.) bottle of the solution indicated for the patient and to set the drip at 40 drops per minute. The bottle will take about four hours to empty.

#### Summary.

Water is distributed throughout the body and a deficiency of water dehydrates both extracellular and intracellular fluids. The results are thirst and oliguria.

Sodium is the most important extracellular electrolyte and deficiency produces a specific

depletion of extracellular fluid volume. If the depletion is severe, oligæmic shock results.

Potassium is the chief intracellular electrolyte. If potassium is lost from extracellular fluid potassium moves out of the cells to repair the deficit and an intracellular deficiency is produced which, if appreciable, interferes with normal cell working. Renal conservation is poor, and potassium output after operation is increased. There is evidence that continued potassium loss after operation is harmful. Potassium is best replaced by mouth but if it has to be given parenterally rules relating to dose and speed of administration must be observed.

#### Appendix.

Normal range of electrolyte concentrations in blood serum or plasma—

Sodium = 315–335 mg. per 100 ml.

Potassium = 15–20 mg. per 100 ml.

Chlorides = 570–615 mg. per 100 ml. (as NaCl).

Alkali Reserve = 55–75 vols. of CO<sub>2</sub> per 100 ml.

(To be concluded)

## LETTERS TO THE EDITOR

### BATTLES LONG AGO

Sir,

As I was a student at the hospital from 1888–92 I was much interested in the article "Bart's in 1893" of the April number of the *Journal*.

Especially in the football at that time as I was a member of the Association football eleven in the years immediately preceding it. Perhaps your readers might like to hear something of the latter when we were more fortunate. We were rather a scratch lot and like the rugby a bit handicapped by some of our men also playing for other clubs. However we did emerge as something of a team in cup ties and held the Hospital Cup for three years beginning with the season 1888–89. In addition we were runners-up for the London Amateur Association Cup in one of those years, being beaten in the final by the Arsenal, playing at the Oval. Previously we met Millwall Athletic in the semi-final whom we defeated after a replay.

Perhaps it would have been better to leave it at that and boast that the old hospital had beaten a member of the League.

Honesty compels one to admit that these two clubs were in an early stage of their careers and at that time played as amateurs, shortly afterwards changing to professional.

My memory of the final dwells rather more upon the picturesque side than upon the actual football on that occasion. It was made something of an event. Imagine two of the old time horse buses

rolling into our dignified square to convey double the number of students they would normally hold to the Oval and you get the picture. Though they may have stopped once or twice on the way they did eventually reach their destination as we knew from the noise they achieved. Though we lost the game we believe a happy time was had by all. Somewhere or other eleven silver medals exist given to us at a presentation by Pa Jackson, a well-known figure then in Association circles and I believe the founder of the Corinthians. Good health be to our present clubs.

Yours truly,

F. J. DIXON.

### BART'S SPORT

Dear Sir,

Your Editorial for May and Mr. Castle's letter inevitably sadden those middle-aged and elderly Bart's men who remember the spirit and the play of the well-trained and hard-hitting teams of over 20 years ago.

Mr. Castle is indeed right when he suggests that hard work can be combined with hard play. The late Professor Woollard taught that there is an aristocracy of both mind and body combined in some men. This was certainly evident at Cambridge just after World War I when 40 per cent of the 'blues' were scholars. There were also many good games players who although only achieving second class Tripos honours were much

in demand for such famous civil services as that in the Sudan, because of their qualities of character, their sense of fair play and good humour moulded on the sports field. The Sudan came to be known as a country of Blacks ruled by Blues.

I think the remedy lies much in the hands of the students' selection board (whatever it is called) probably more so than the efforts of the captains of the Clubs. In recent years we have lost men of the required calibre whom we used to attract. A nucleus of University blues, or those very near this standard, would attract their friends and others of a like nature and in time tradition would become established again.

It used to be possible to pass the primary F.R.C.S., win an entrance scholarship and take a successful part in a championship final within 10 days, and it must be so to-day.

Baron Pierre de Coubertin, the founder of the modern Olympic Games, laid it down that "The important thing is not winning but taking part. The essential thing in life is not conquering but fighting well." Indeed that old knave Falstaff (Henry IV) had much the same idea when in one of his rants he said, "Will you tell me, Master Shallow, how to choose a man? Care I for the limbs, the thewes, the stature, bulk and big assemblance of a man! Give me his spirit, Master Shallow."

So let us hope that among our 700 students there will arise many spirited young men to realise the value and the delights that can be obtained from physical discipline and corporate endeavour in team games, and by so doing save us from any future and depressing editorials that savour of 'Ichabod'.

H. B. STALLARD.

"W.G."

Dear Sir,

Your first leader in the May number reminds me of an amusing story about "W.G.", told me by a friend.

Her father, a Mr. Loewenstam, was an artist interested in all forms of art, but he had no use whatever for sport. One evening in the nineties he came home and told his family that, as he was passing Lord's, the people were coming out. He said to his neighbour on the bus: "What an awful waste of time all these people spending hours watching a cricket match." The reply was: "Well, perhaps I don't see eye to eye with you in that matter. You see my name's Grace." "Mine's Loewenstam" was the immediate response and then he wondered why the family went into fits of laughter.

Yours faithfully,

N. S. FINZI.

Cobham, Surrey.

### A WORTHY SYMBOL

Sir,

Not the least interesting feature of your admirable Coronation number is the photograph (page 137) of Miss Isabel Armitage, Sister Surgery (with her Staff Nurse, Miss Garnett).

Housemen and dressers of the first decade of the century will recall with pride and affection this fine figure of authority, vigour and kindness—the commanding voice and the noble profile; to our large district of poverty and distress she was St. Bartholomew's—a worthy symbol, a gracious and ready help.

Yours, etc.,

REGINALD MORSHEAD.

Stepping, Sussex.

## TED THE TWISTER

Yesterday I am walking down Harley Street, which is much frequented by croakers of all sorts and I meet up with Ted the Twister. He is called Ted the Twister not so much for his skill in evading difficult situations but because he twists people's arms and legs, sometimes straight or sometimes crooked as the case may be. We talk of this and that and he says 'I have a lucky escape'. This by no means surprises me but I affect both interest and surprise. 'Yes' says he, 'I am in Wimpole Street yesterday and there rushes down the road on a motor bicycle a guy with a passenger guy on the back. The bicycle hits a brick and off shoots the passenger and lies very still in the road. The driving guy is maybe deaf and doesn't notice, and goes away. So I join the crowd and a doll near me says 'Look his head is bent round the wrong way' and straight away faints. 'I leave her to lay where she falls' says Ted, 'for she is homely in the extreme,

and I look at the passenger and see that what the doll says about his head is true. This seems unnatural to me, so I twist his head right way round after much effort, but it gives a crack and the guy stops breathing. So I get back in the crowd which is more interested in the doll than in the guy and wait to see what goes on next. What goes on next is an ambulance, and a brisk young interne hops out and undresses the crooked passenger, and when they take off his overcoat I see that it had been buttoned on back part before to keep out the draughts, so my twisting had not been so good for him. So I slips off round the corner into Harley Street before you can say orthopaedics, which is a long word at that.

Ted the Twister is now on leave in another part of the country until he hears that the coroner decides Death from Natural Causes.

G.B.

## ON SOAP

By R. M. B. MacKENNA

ALL too often in clinical medicine it is the apparently simple question asked by the intelligent patient which falls on the solar plexus of one's ignorance with breath-taking force. To many of us the innocent enquiry: "What soap shall I use, doctor?" comes into this category.

This matter of soap isn't as easy as the more elementary text books and the advertisements in the pulp magazines would have us believe; in fact, the bigger the text book the more chary the author seems to be of evolving a water-tight, short definition; he may commence with a brief statement to the effect that soap is formed by the combination of a fatty acid with an alkali, but then hastily begins adding caveats concerning insoluble metallic soaps and details about aluminium and zinc stearates and other matters which need not concern us here.

Harry (1948) states that ordinary toilet and household soaps are "sodium soaps," whilst shaving soaps and creams and shampoos are "potassium soaps"; the latter are made by the action of potassium hydroxide on a mixture of fats or fatty acids, and the former by the activities of sodium hydroxide. When sodium soaps are made, the glycerin, which is also formed, is removed and a "soap stock" is prepared. For household soaps, colouring, preservatives, perfume and sometimes sodium silicate are added. For toilet soap the stock is dried to reduce the water content to about 14 per cent., perfume is added and the soap is milled (i.e. passed between rollers) and plodded so as to obtain the desired physical properties, including lathering efficiency. To overcome the difficulty of obtaining a good lather in hard water 15-25 per cent. coconut or palm kernel oils are used; the very few people who become "allergic to toilet soap," are usually sensitive to products (e.g. salts of lauric acid) derived from these oils; occasionally sensitisation to perfume, colour or other additives occurs.

Super-fatted soaps contain an excess of fats, the purpose being to replace with a thin layer of emollient the sebum removed from the skin by washing, thus keeping the horny layer of epidermis supple.

Shaving soaps and creams have to provide an adequate, long-lasting lather, and potassium stearate in conjunction with saponified

coconut oil is very frequently used by the manufacturers to achieve this. An excess of fatty acid is used in their formulation as this ensures that there will be no free alkali to damage the skin.

Liquid soap shampoos may be formed of potassium-coconut oil soaps which lather well but which may irritate some people's skins (see above), or may be formed by a mixture of saponified coconut, olive or other oils.

Green soft soap was made from olive oil and potash, but the B.P. now allows suitable vegetable oils (or the fatty acids derived therefrom) and sodium or potassium hydroxide to be used in its manufacture; Hebra's spirit soap, thousands of gallons of which must have been prescribed for scurfy heads, consisted of equal parts of potash (soft) soap, spirit of lavender and rectified spirit; nowadays, spirit, saponis kalini (Hebra) made according to the B.P.C. 1949, contains 650 grammes potash soap, 3.1 ml. oil of lavender, and spirit (which, in practice, is industrial spirit) to 1 litre.

Many women do not like soap shampoos; they complain, particularly in areas where the water is "hard," that unless they rinse their hair excessively after washing, curds of soap remain clinging to the hair, which tends to lose its lustre. To overcome this and other difficulties the modern soap-less shampoos were introduced; one of the earliest which is still in much demand, is based on a derivative of triethanolamine: it is excellent for women or men with seborrhoea (i.e. for those having an abundant secretion of sebum, who state "I have to wash my hair frequently for it goes greasy if I don't"), but is too de-greasing for those who have a scanty secretion of sebum, and if much used by these persons, fragility and splitting of the hair may be noted. Other modern shampoos contain the so-called but incorrectly named "sulphonated fatty alcohols," of which sodium lauryl sulphate is popular; it is sold under various names, particularly as a powder shampoo; probably, as sold, it is less de-greasing than triethanolamine; Harry states that one-fifth of an ounce of the powder is sufficient for a shampoo; one of the manufacturers' headaches is to add sufficient bulk of other powder to this tiny amount to make the customer feel she is

getting her money's worth. Cream shampoos are a recent innovation; they are supposed to be less de-greasing than ordinary soap-less preparations.

In the Skin Department we were rather intrigued with the possibilities of cream shampoos; also we were anxious that certain of our patients should not employ proprietary shampoos which just possibly might react adversely with some lotion or ointment which we had prescribed. The Dispensary prepared a very satisfactory cream shampoo, having the following formula (the manufacturing cost is 4d. per ounce):—

R: Borax...	...	1 per cent.
Lanolin	...	3 " "
Lanette Wax S.X.	...	2 " "
Water	...	20 " "
Glycerin of Starch	...	14 " "
Sulphonated "Lorol"	...	" "
Paste	...	60 " "
Sig.: Lanolin Shampoo Cream.		

The best soap flakes are sodium soaps having a water content of about 10 per cent.

Various medicaments, e.g. thymol, may be incorporated in spirit shampoos. Drugs may also be incorporated in hard (tablet) soaps, but it has been taught that these are of little benefit as the drugs are of necessity much diluted and their action very transient; this rather sweeping view may need revision, as Gordon and Unsworth have proved that scabies may be both prevented and cured by the use of hard soap containing 5–10 per cent. tetra-ethylthiuram monosulphide.

Now what about the patient whose innocent question produced the foregoing excursion into deep lathers?

Briefly—and rather dogmatically, for others might disagree—the fairly normal members of *homo sapiens* may be divided into three types: those with greasy skins ("I have to wash my hair often"), those with somewhat dry skins ("I have to use brillian-tine to keep my hair fixed"), and those whose output of sebum is not too little and not too much. Representatives of the first category can use with satisfaction any of the toilet soaps which are available, and need not necessarily use superfatted soaps. Their skin resists well the somewhat stronger action of potassium soaps which, unless specially prepared, are usually regarded as being "harder on the skin" than sodium soaps. Persons with dry skins prefer super-

fatted soaps, and if they cannot find something satisfactory in the usual range can be asked to employ "baby soaps," or others made for delicate skins such as Midgley's basic superfatted soap, Albion Simple Soap, etc. (There are others, and apologies are required because exigencies of space forbid their mention).

For the greasy, sometimes scurfy, scalp, spirit shampoos, green soft soap, triethanolamine and "sulphonated fatty alcohol" shampoos are usually satisfactory. For dry scalps, a liquid soap shampoo or a cream shampoo are reasonable. The hair of a greasy scalp is unlikely to be damaged by washing with an adequate shampoo once every five or seven days.

In general, psoriasis, small indolent patches of seborrhoeic dermatitis, acne vulgaris, and pityriasis capitis (dandruff) are the only cutaneous maladies in which the patient should be encouraged to wash the affected areas. Others, particularly eczema, can be kept going merrily for months by a good daily wash. Carbolic soap, excellent though it is for many persons, and the most satisfactory of all for removing "B.O.", can be very usefully employed by malingerers suffering from occupational dermatitis who want to keep their eruption florid.

"Do I wash myself too much, doctor?"

The answer depends on your skin—oily, normal, or dry—on the soap you use, the type of water available, and the heat of your bath. Few skins were made to withstand two very hot baths a day, and if you have to immerse yourself twice daily a shower is quicker, uses less water, and has fewer potentialities of causing damage. You can't confuse the issue by adding bath salts, detergents or antiseptics to a shower. Nevertheless, in U.S.A., so-called "bath pruritus" is on the increase and there are many more cases here than are recognised. If you go to the tropics you are more likely to develop prickly heat by over-washing than by the reverse.

"Is soap dangerous, doctor?" No. We have a very great deal for which to thank the soap-manufacturers. The incidence of trouble due to soap is negligible when one considers the millions of times it is used in this country every day. If one brand of soap dries your skin too much, many other brands will suit you; your chemist is well qualified to advise you.

**Acknowledgments:** I have to thank Mr. J. R. Elliott, Pharmacist to the Hospital, and Dr. V. R. Wheatley, for their helpful comments when this essay was being written. **References:** GORDON, R. M. and UNSWORTH, K. (1944). *Ann. Trop. Med. Parasit.*, 38, 207. HARRY R. G. (1948). *The Principles and Practise of Modern Cosmetics*; Vol. 2; Cosmetic materials (1948), London; Leonard Hill Ltd.



## SPORT

## RUGGER CLUB

## Results :

- v. Berkshire Wanderers away—lost 13-3.  
v. Metropolitan Police home—won 11-3.

## Middlesex Seven-a-side Competition :

- Round 2 v. Tabor—won 27-0.  
Round 3 v. Pinner—won 13-0.  
Round 4 v. Old Millhillians—won 8-5.  
Round 5 v. Gala (at Twickenham)—lost 6-5.

The annual general meeting of the Rugby Football Club was held in the recreation room, Charterhouse, on 4th May, and the following Officers were elected for the coming season :

President, Dr. E. F. Scowen. Vice-Presidents, Mr. J. W. Cope, Mr. F. C. W. Capps, Prof. Sir J. P. Ross, Mr. D. B. Fraser, Dr. G. Ellis, Dr. C. F. Harris, Dr. N. C. Oswald, Mr. W. D. Coltart, Prof. A. J. E. Cave, Mr. E. G. Tuckwell (elected at the A.G.M.). Captain, E. F. D. Gawne (re-elected). Vice-Captain, D. W. Roche, Treasurer, P. J. Burrows. Secretary, D. A. Lam-miman. Hon. Fixture Secretary, Mr. J. W. Cope. Publicity Manager, W. B. Castle.

The Annual Dinner of the Rugby Football Club was held at "Ye Olde Cocke Tavern", Fleet Street. There was a large attendance by the members of the Club. Dr. E. F. Scowen was in the chair and performed in his usual inimitable manner. Mr. E. G. Tuckwell proposed the health of the Club, and the Club Captain Mr. E. F. D. Gawne replied.

## GOLF CLUB

At the Annual General Meeting, P. Sleight was elected Captain and R. B. Deering as Secretary.

## v. King's College Hospital

On March 18th, at Sundridge Park, the team started the season off well, winning by 3-1. R. B. Deering and B. Wheeler had convincing wins. Dr. McIlroy and P. Sleight halved their matches.

## v. Guy's

At Sundridge Park, a depleted Bart's side was no match for a very strong Guy's team, and lost 5-1. Our only winner was B. Wheeler.

R. B. Deering and P. Sleight have so far this season played regularly for London University Blasters.

Colours for the 1952 season have been awarded to C. J. R. Elliot, R. Draper, P. Sleight, P. Ford and R. B. Deering.

## CRICKET

1st XI v. St. Thomas's Hospital, on April 25th—lost.

St. Thomas's Hospital 178-6 dec. (Winton 4-63).  
Bart's 83 (Lawson 31).

1st XI v. London House, on May 3rd—lost.  
Bart's 103 (Ford 26).

London House 104-9 (Rosborough 3-21).

1st XI v. R.A.M.C. on May 9th—lost.  
Bart's 121 (Hodgson 45, Rycroft 26).  
R.A.M.C. 122-3 (Chinnery 2-35).

1st XI v. Hampstead, on May 10th—lost.  
Hampstead 258-5 dec. (Rosborough 4-76).  
Bart's 137 (Nicholson 53, Ford 51).

1st XI v. Romany, on May 17th—lost.

Romany 258-1 declared.

Bart's 103. (Nicholson 25, Morley 24).

Oxford Tour. 1st XI v. Balliol College, on May 23rd—drawn.  
Bart's 162 (Fox 55, Rycroft 30).  
Balliol College 82-9. (Winton 5-16, Foy 3-21).

1st XI v. Radcliffe Infirmary, on May 24th—drawn.  
Bart's 149 (Rycroft 61, Ford 35, Hodgson 25).

Radcliffe Infirmary 111-8 (Ford 3-22).

2nd XI v. Erith Town, on May 10th—lost.

Erith Town 156-6 declared.

Bart's 56.

2nd XI v. Royal Free Hospital, on May 16th—lost.

Royal Free 118.

Bart's 98 (Ellis 42 n.o.).

## BOAT CLUB

At Chiswick Regatta the hospital was represented by a coxwainless light four rowing in the Junior Senior event, for oarsmen who have never won a senior event. They beat Quinton B.C. by four lengths in the first heat and in the semi-final lost to Royal Air Force (Benson) R.C. by three-quarters of a length.

At Walton the next week, in a similar event, they had better fortune.

In the first heat the Hospital beat Ibis R.C. by four lengths; in the semi-final they beat Thames Tradesmen R.C. by three lengths and went on to win the event by beating Midland Bank R.C. by two and three-quarter lengths.

This is the first open event to be won by the Hospital for two years.

Crew: J. M. Gray, bow, steers; 2, C. N. Hudson; 3, J. F. Pigott; D. H. Black, stroke. Coach, T. Edwards of 1st and 3rd Trinity B.C. and L.R.C.

This crew hopes to race up river later in the season.

## SQUASH CLUB

The Donaldson Cup for 1953 was won by P. Mitchell, who beat the captain, J. Murrell, 9-0, 9-7, 9-3 in the final.

The match was not as exciting as last year's final, though it was not as one-sided as the score suggests. Clearly both players were stale and had lost their touch after the heavy season. Mitchell took service and easily won the first game before Murrell had settled down. Then the latter, playing better, took a 7-5 lead in the next, but two delightful drop shots brought Mitchell level. After this he never looked back. He went on to win because he varied his game, using the side walls and short balls effectively while Murrell was content to defend.

It was pleasing to note that only four lets were given despite the strain imposed upon the players. Mr. Donald Fraser later presented the Cup to the winner.

M.D.

### SAILING CLUB

The Sailing Club continues to flourish as an integral part of the United Hospitals Sailing Club. It is the largest individual hospital club, has a high proportion of helmsmen and has several members regularly racing for U.H.S.C. against other clubs. Membership continues to increase and new members, preclinical particularly, are most welcome. Details can be obtained from any member.

The annual two day regatta was held at Burnham on the 4th and 5th of June in ideal weather. Sixteen helmsmen competed for the Commodore's Trophy which was won by E. J. Hill. The ladies' race was won by Miss A. C. M. Wickham. A most successful innovation this year was the seamanship race, a test primarily of boat handling, which was won by H. V. Blake.

#### Results:

Commodore's Trophy: 1st, E. J. Hill; 2nd, M. E. B. Hayes; 3rd, J. T. Snow.

Ladies' Race: 1st, Miss A. C. M. Wickham; 2nd, Miss P. M. Jones; 3rd, Miss B. A. Jepson.

Seamanship Race: 1st, H. V. Blake; 2nd, M. E. B. Hayes; 3rd, A. Smart.

The Firefly racing dinghy having been fitted out by members is being raced regularly on the Brent reservoir with the London University Sailing Club. Its more general use has resulted in a definite improvement in the standard of helmsmanship, which was reflected in the excellent racing enjoyed during the regatta.

### ATHLETIC CLUB

The Athletic Club started the season with an urgent need for new members—fortunately several were forthcoming from Charterhouse, and they have formed the nucleus of the team. We are still sadly lacking in runners for the longer distances, e.g. 1 mile and 3 miles, and the all-round standard in the field events could be improved.

The results of the matches to date are:

#### Wednesday, May 6th, at Ladywell

1. Guy's Hospital
2. Bart's
3. Westminster Hospital

#### Saturday, May 16th, at Colliers Wood

1. Bart's
2. Chelsea Polytechnic

#### Wednesday, May 20th, at Norbury

1. Southgate Harriers
2. Bart's
3. Westminster Bank

The 70th Annual Sports were held at Chislehurst on Saturday, 6th June. The weather was kind to us for the second successive year, but the Coronation celebrations, the Derby and various Rowing and Sailing Regattas probably accounted for the spectators being fewer in number than on previous occasions.

Mr. D. B. Fraser controlled the afternoon's pro-

ceedings admirably, and we are very grateful to Mrs. Fraser for so graciously presenting the trophies. Once again the members of the Staff supported us magnificently and we thank them all most sincerely for their invaluable assistance. Mr. White and his ground staff had done an excellent job in preparing the track, which was, as usual, in first class condition; and Mrs. White, Miss Bott and her willing assistants worked heroically behind the scenes to produce the teas. We are greatly indebted to them all for making the day such an enjoyable one.

### SPORTS DAY RESULTS

#### 3 Miles:

1. D. M. Stainton-Ellis. 15 mins. 49.8 secs.
2. J. A. Stainton-Ellis.

#### 1 Mile:

1. D. M. Stainton-Ellis. 4 mins. 37.6 secs.
2. C. Charlton.

#### 880 Yards:

1. J. A. Stainton-Ellis. 2 mins. 5.4 secs.
2. D. M. Stainton-Ellis.

#### 440 Yards:

1. A. S. Wint. 54.4 secs.
2. A. H. MacDonald.

#### 220 Yards:

1. A. S. Wint. 23.6 secs.
2. L. Pringle.

#### 100 Yards:

1. L. Pringle. 10.6 secs.
2. P. McDonald.

#### 120 Yards Hurdles:

1. A. S. Wint. 16 secs.
2. A. S. Tabor.

#### 120 Yards Handicap:

1. D. A. Lammiman. 12.4 secs.
2. P. McDonald.

#### High Jump:

1. B. W. Badley. 5 ft. 6½ ins.
2. D. A. Lammiman.

#### Long Jump:

1. P. McDonald. 20 ft. 4½ ins.
2. B. W. Badley.

#### Pole Vault:

1. J. T. Snow. 7 ft. 11 ins.
2. B. W. Badley.

#### Weight:

1. D. F. Craggs. 38 ft. 8 ins. (Record)
2. J. C. Craggs.

#### Javelin:

1. L. Cohen. 123 ft. 10 ins.
2. D. Rosborough.

#### Discus:

1. D. A. Lammiman. 86 ft. 6 ins.
2. P. McDonald.

#### "Housemen's 100":

1. Dr. B. D. Lascelles. 10.4 secs.
2. Dr. A. E. Dormer.

#### Inter-Firm Relay:

1. Clinical. 1 min. 35 secs.
2. Preclinical B.

### PATHOLOGICAL DEPARTMENT

Junior Registrar—Mr. P. J. A. Butcher from 1.7.53.

### DEPARTMENT OF ANAESTHESIA (Hill End)

Registrar—Mr. T. B. Boulton (vice Jackson) from date to be arranged.

The following appointments to the medical staff have been made with effect from the dates indicated:

### GYNAECOLOGICAL AND OBSTETRICAL DEPARTMENT

Junior Registrar—Mr. N. Gourlay (vice Struthers) from 1.9.53.



**EXAMINATION RESULTS****UNIVERSITY OF LONDON****FINAL M.B., B.S. EXAMINATION FOR MEDICAL DEGREES April, 1953****Honours**

Crosfill, M. L. (Distinguished in Obstetrics and Gynaecology)  
 Hodgson, M. J. (Distinguished in Medicine)  
 Jones, B. S. (Distinguished in Obstetrics and Gynaecology)  
 Knipe, P. (Distinguished in Surgery)  
 Warburton, T. H. M. (Distinguished in App. Pharm. and Thera.)

**Pass**

Biddell, P. B.	Fieldus, P. L.	Langdon-Herring, L.	Roberts, T. M. F.
Bird, G. C.	Geldart, R. E. M.	Lewis, B.	Ryan, A. M.
Brooks, E. F.	Glassett, M. C.	McKerrow, M. B.	Ryan, H. S. S.
Brown, I. P.	Gray, J. M.	Mercer, M. H.	Shere, S.
Brown, J.	Gretton, A. H.	Moffat, D. B.	Southgate, B. A.
Bunting, J. S.	Hall, J. M.	Morgan, D. T. G.	Stather-Dunne, M. T.
Caldwell, A. M.	Hall, T. E.	Mules, R. J.	Stephenson, J. W.
Castell, E. O.	Hill, D. A.	Newill, R. G. D.	Storey, V. C.
Chia, A. K.	Hopkins, J. S.	Parker, R. B.	Thomas, B. D.
Chitham, R. G.	Husainee, M. M.	Paterson, I. S.	Thomas, D. H. C.
Clarke, D. J. A.	Ivens, H. P. H.	Pearsons, D. E.	Thomas, P. I.
Davies, A. P.	Kaan, N.	Porteous, C. J.	Vickery, C. M.
Davies, G.	King, P. A. H.	Pugh, M. A.	Whittard, B. R.
Dunger, G. T.	Lacey, S. M.	Rimmer, B. K.	Wilson, M. S.

**SUPPLEMENTARY PASS LIST****Part I**

Adam, R. M.	Cudkowicz, M. R.	McAdam, B. N.	Rimmer, A. H. M.
Andrewes, D. A.	Davies, M. B.	Mackay, A.	Scott, H. G.
Boomla, D. F.	Fisher, F. M.	McLean, I. E. D.	Smith, E. P.
Brazenor, E. L. F.	France, G.	Martin, R. M.	Staunton, M. H.
Cairns, J. E.	Hill, E. J.	Matheson, P.	Thompson, S. G.
Casson, A. J.	Hyland, R. K.	Mears, G. W. E.	Whitting, H. W.
Cochrane, J. G.	Iles, D. S.	Morlock, R.	Wilkinson, D.
Cour-Palais, A. J.	Keet, S. J.	Prior, J. J.	Wint, A. S.
			Wyner, S. E. A.

**Part II**

Bloom, M.	Evans, M.	Scott, H. G.	Shaw, D. M.
Thomas, H. A. J.			

**Part III**

Bloom, M.	Davies, J. R. E.	McAdam, B. N.	Marshall, L. J.
Boomla, D. F.	Davies, M. B.	McLean, I. E. D.	Taylor, G. I.
Brown, J. R.	Evans, M.	Marker, H. R.	Ullmaun, H. A.

**Part IV**

Boomla, D. F.	Goode, J. H.	Marker, H. R.	Thomas, G. E.
Brown, J. R.	Hick, B. D.	Scott, H. G.	Thomas, H. A. J.
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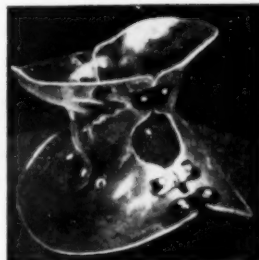
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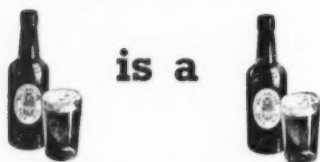
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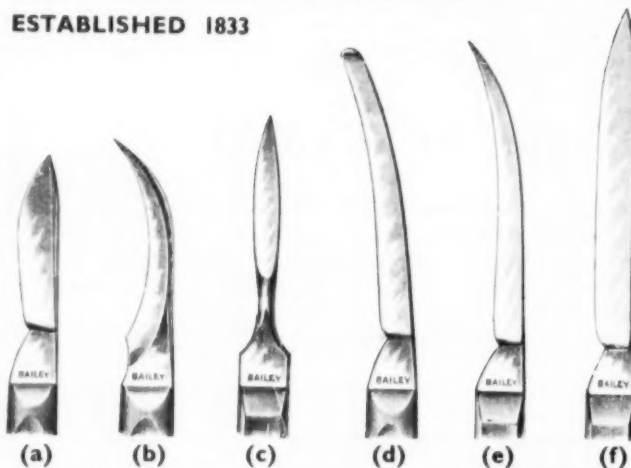
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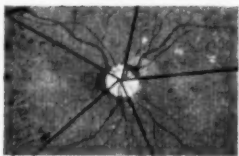
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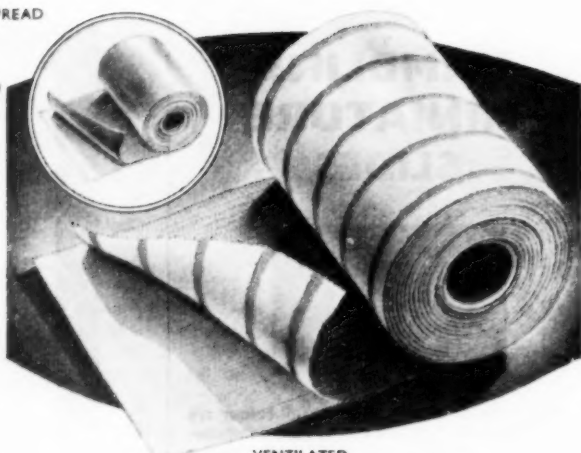
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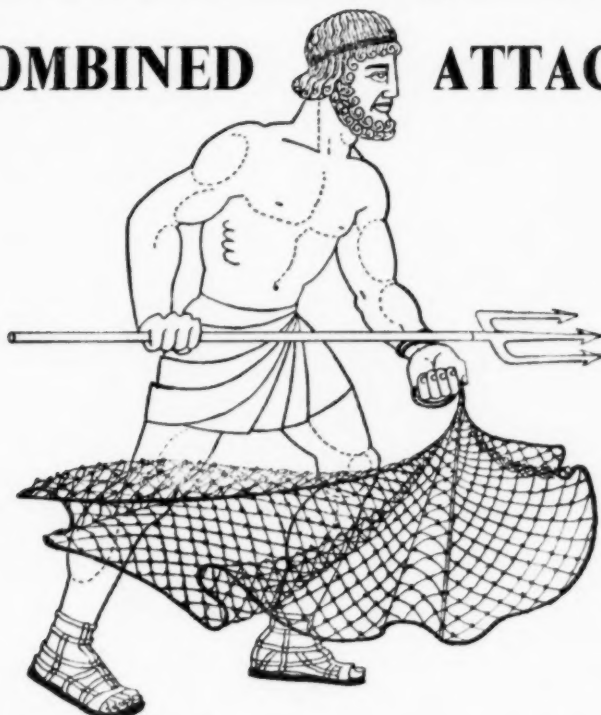
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